

UNITED STATES PATENT AND TRADEMARK OFFICE  
**CERTIFICATE OF CORRECTION**

PATENT NO. : 7,353,157 B2  
APPLICATION NO. : 10/043981  
DATED : April 1, 2008  
INVENTOR(S) : Wasynczuk et al.

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It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 4, line 16, the formula should appear as follows: --  $B_{tree}^{active}$  --

Column 8, line 35, the formula should appear as follows: --  $G_{trees}^g = (N, B_y)$ --

Column 12, line 42, figure (2.28) the formula should appear as follows:

$$\hat{A}_a \hat{i}_{br} T_p = \hat{A}_a \hat{i}_{br} = 0$$

Column 12, line 52, figure (2.30), the formula should appear as follows:

$$\hat{i}_{br} = [i_y, i_x]$$

Column 17, line 20, figure (2.112), the formula should appear as follows:

$$-K_C = C_y^{-1}-$$

Column 32, line 6, figure (3.102), the formula should appear as follows:

$$- \text{MinSTA}(\tilde{G}, w_L) \Rightarrow \tilde{G}_{trees} = (\tilde{N}, B_y^{LA}) -$$

Column 42, line 14-23, figure (4.18), the formula should read as follows:

$$\begin{aligned} i_{br}^C = & \left( \left( G_{br} + \frac{dC_{br}}{dt} \right) (A_a^C)^T - C_{br} (A_a^C)^T C_y^{-1} \left( G_y + \frac{dC_y}{dt} - D_a^{CA} D_v^A \right) \right) v_y \\ & + (C_{br} (A_a^C)^T C_y^{-1} (D^{LC} + D_a^{CA} D_I^A)) i_x \\ & + (C_{br} (A_a^C)^T C_y^{-1} (A_a^C + D_a^{CA} D_f^A) - I^C) j_{br}^{CA} \\ & + (C_{br} (A_a^C)^T C_y^{-1} D_a^{CA} D_s^A) e_{br}^A = C_C^{CA} v_y + C_C^{LA} i_x + D_C^{CA} j_{br}^{CA} + D_C^A e_{br}^A \end{aligned}$$

Column 46, line 2, should read --where  $M_L(t)$  and  $M_C(t)$  are so-called mass matrices that can be dependent on time and state--

Column 47, lines 52-56 should read

--In other words, the vectors (or more precisely trajectories)  $i_{br}^L$  and  $v_{br}^C$  must be bounded and continuous across topological boundaries. Recalling how  $i_{br}^L$  and  $v_{br}^C$  are related to the vectors of independent inductor currents and capacitor voltages, (5.11)-(5.12) can also be rewritten as--

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Column 48, lines 5-6, figures (5.17) and (5.18) should read:

$$\begin{aligned} \text{-- } (\mathbf{B}_{i+1}^L)^+ &= \mathbf{T}_L^{i+1} \begin{bmatrix} \mathbf{0} & \mathbf{I}_{i+1}^L & \mathbf{0} \end{bmatrix}^T = (\mathbf{B}_{i+1}^{base})^T \text{ --} \\ (\mathbf{A}_{i+1}^L)^+ &= \mathbf{T}_C^{i+1} \begin{bmatrix} \mathbf{I}_{i+1}^C & \mathbf{0} & \mathbf{0} \end{bmatrix}^T = (\mathbf{A}_{i+1}^{base})^T \end{aligned}$$

Column 48, line 8, should read --It can be noted that  $\mathbf{B}_{i+1}^{base}$  and  $\mathbf{A}_{i+1}^{base}$  are full-rank--

Column 48, lines 15-17, figures (5.19) and (5.20) should read:

$$\begin{aligned} \text{-- } \mathbf{i}_x^{i+1} &= \mathbf{B}_{i+1}^{base} \mathbf{i}_i^L \text{ --} \\ \mathbf{v}_y^{i+1} &= \mathbf{A}_{i+1}^{base} \mathbf{v}_i^C \end{aligned}$$

Column 48, lines 31-34, figures (5.24) and (5.25) should read:

$$\begin{aligned} \text{-- } \mathbf{i}_i^L &= \mathbf{i}_{i+1}^L = \mathbf{i}_{br}^L, \text{ and } \|\mathbf{i}_{br}^L\|_\infty < \infty \text{ --} \\ \mathbf{v}_i^C &= \mathbf{v}_{i+1}^C = \mathbf{v}_{br}^C, \text{ and } \|\mathbf{v}_{br}^C\|_\infty < \infty \end{aligned}$$

Column 54, line 33-34, figure (6.5) should read:

$$\begin{aligned} \text{-- } \mathbf{i}_{br}^C(k) &= \sum_{l \in M_l^C} \mathbf{G}_{br}^C(k, l) \mathbf{i}_{br}^L(l) + \sum_{m \in M_b^C} \frac{d\mathbf{U}_{br}}{dt}(k, m) \mathbf{v}_{br}^C(m) \\ &+ \sum_{n \in M_i^C} \mathbf{C}_{br}^C(k, n) \frac{d}{dt} \mathbf{v}_{br}^C(n) - \mathbf{J}_{br}^C(k) \text{ --} \end{aligned}$$

Column 57, line 21, figure (6.19) should read:

$$\text{-- } \mathbf{g}^C(\mathbf{u}, t) = \mathbf{A}_a^{C,C} \mathbf{j}_{br}^C - \mathbf{D}_a^{CA} \mathbf{i}_{br}^A - \mathbf{D}^{LC} \mathbf{i}_x^L \text{ --}$$

Column 61, line 33, figure (6.27) should read as follows:

$$\text{-- } \eta_{6.14}(n) = \Theta[n^2(\overline{m}^2 + 1)] \text{ --}$$

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Column 66, beginning with line 46, the text of claim 1 should be replaced in its entirety with the following:

--A computer-implemented method, comprising:

creating one or more data structures that together store characteristics of a plurality of active branches  $B^{active}$  that make up a graph of nodes and branches that form a circuit, wherein  $B^{active}$  consists of

a set  $B^L$  of zero or more inductive branches, each having a non-zero inductive component but neither a capacitive component nor a variable switch state;

a set  $B^C$  of zero or more capacitive branches, each having a non-zero capacitive component but neither an inductive component nor a variable switch state; and

a set  $B^A$  of additional branches, each having neither an inductive component, nor a capacitive component;

partitioning  $B^{active}$  into a first branch set  $B_{tree}^{active}$  and a second branch set  $B_{link}^{active}$ , where the branches in  $B_{tree}^{active}$  form a spanning tree over  $B^{active}$ , giving priority in said partitioning to branches not in  $B^L$  over branches in  $B^L$ ;

sub-partitioning  $B_{link}^{active}$  into a third branch set  $B_{link}^L$  and a fourth branch set  $B_{link}^{CA}$ , where  $B_{link}^L = B_{link}^{active} \cap B^L$ ;

identifying a fifth branch set  $B^{CA}$  as the union of

$$B_{link}^{CA},$$

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$$B^C \cap B_{tree}^{active}, \text{ and}$$

those branches in  $B_{tree}^{active}$  that form a closed graph when combined with  $B_{link}^{CA}$ ,  
partitioning  $B^{CA}$  into a sixth branch set  $\tilde{B}_{tree}^{CA}$  and a seventh branch set  $\tilde{B}_{link}^{CA}$ , where the  
branches in  $\tilde{B}_{tree}^{CA}$  form a spanning tree over  $B^{CA}$ , giving priority in said partitioning to  
branches in  $B^C$  over branches not in  $B^C$ ;

identifying an eighth branch set  $B_{tree}^C = \tilde{B}_{tree}^{CA} \cap B^C$ ;

selecting a set of state variables comprising:

for each branch of  $B_{link}^L$ , either the inductor current or inductor flux,

and,

for each branch of  $B_{tree}^C$ , either the capacitor voltage or capacitor

charge; and

simulating a plurality of states of the circuit using the set of state variables.--

Column 67, line 34, the word "--true--" should be replaced with the word --tree--.

Column 68, line 4, "--t<sub>i</sub>--" should be replace with --t<sub>i</sub>--

Column 68, line 11, "--t<sub>i</sub>--" should be replace with --t<sub>i</sub>--

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Column 68, line 14, the word “-forte-” should be replace with --for the--

Signed and Sealed this

Twenty-eighth Day of October, 2008

A handwritten signature in black ink, reading "Jon W. Dudas". The signature is stylized, with a large loop for the "J" and a cursive "Dudas".

JON W. DUDAS  
*Director of the United States Patent and Trademark Office*